FIG. 1

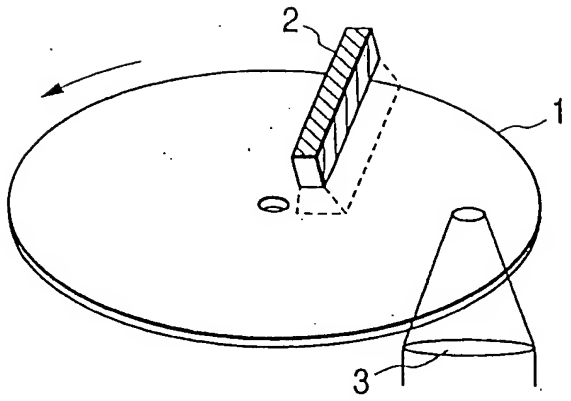


FIG. 2

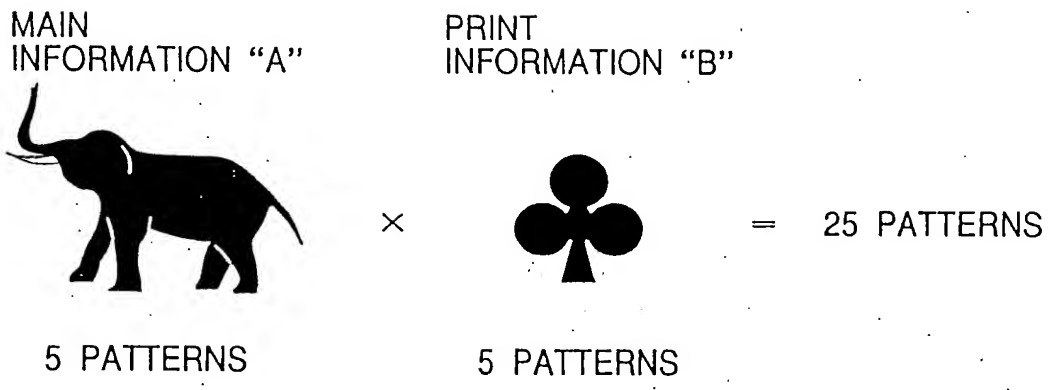


FIG. 3

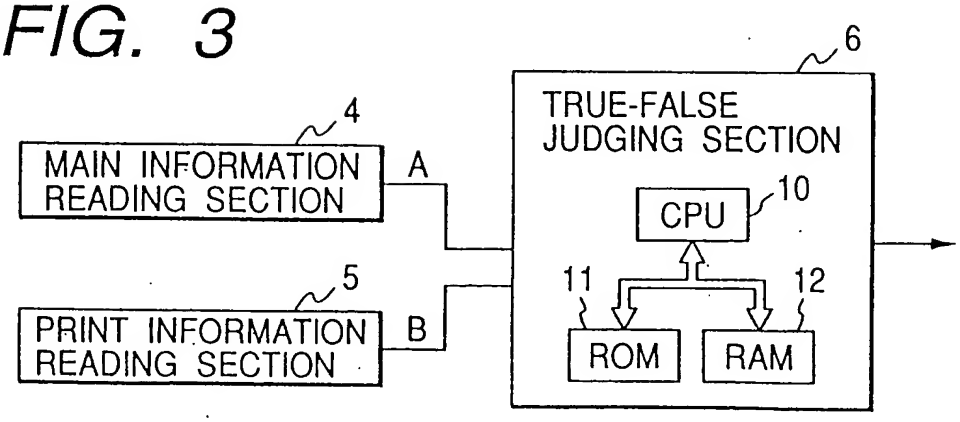


FIG. 4

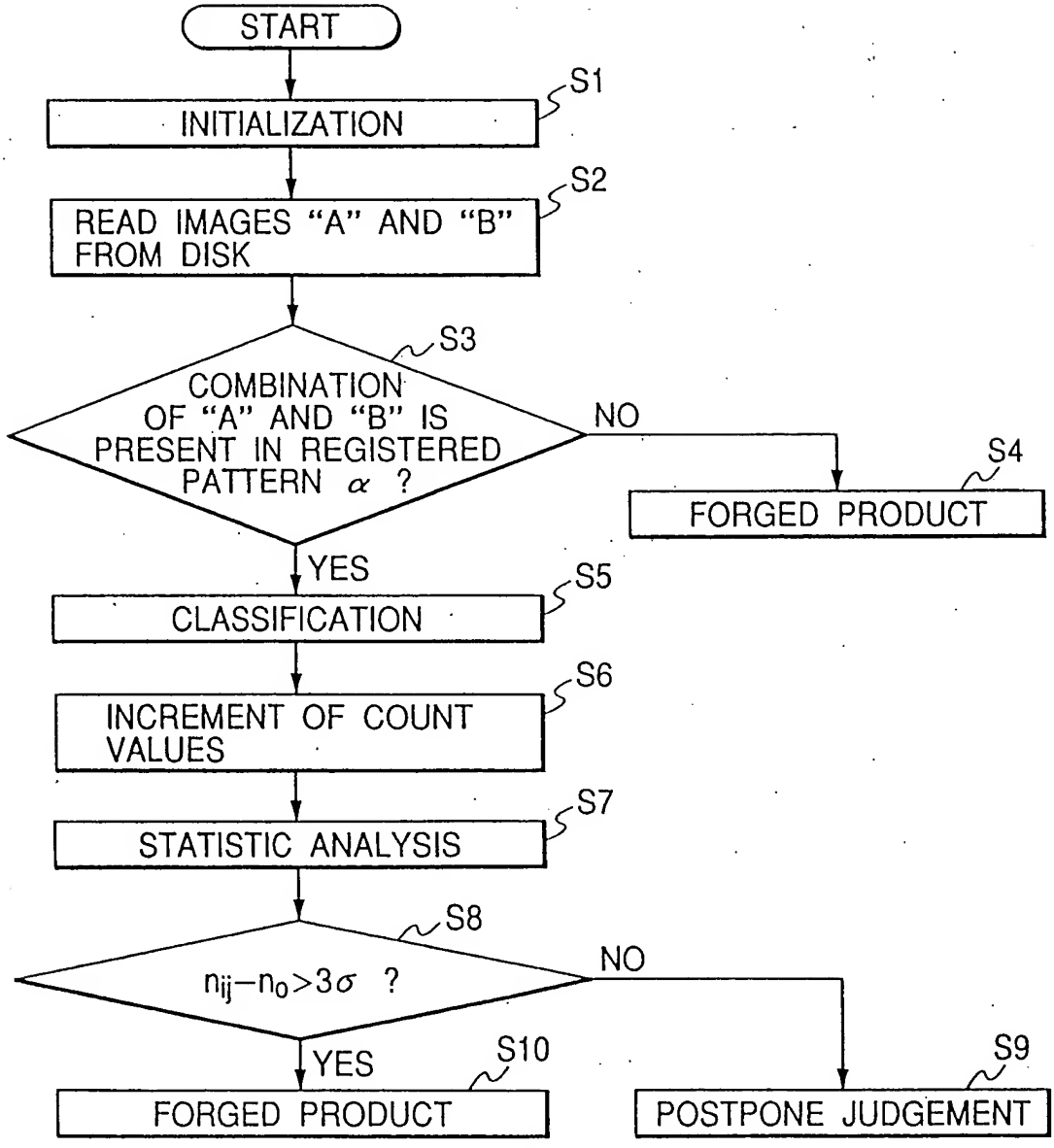

START
INITIALIZATION
S1
READ IMAGES "A" AND "B" FROM DISK
S2
COMBINATION OF "A" AND "B" IS PRESENT IN REGISTERED PATTERN α ?
S3
NO
FORGED PRODUCT
S4
YES
CLASSIFICATION
S5
INCREMENT OF COUNT VALUES
S6
STATISTIC ANALYSIS
S7
$n_{ij}-n_0>3\sigma$?
S8
NO
YES
FORGED PRODUCT
S10
POSTPONE JUDGEMENT
S9

FIG. 5

COMBINATION PATTERN	11	12	13	14	15	21	22	-------	55	N
INFORMATION IN RAM										
(START OF OPERATION)	0	0	0	0	0	0	0		0	0
(FIRST DISK)	0	0	1	0	0	0	0		0	1
(SECOND DISK)	0	0	1	0	0	1	0		0	2
(THIRD DISK)	0	0	2	0	0	1	0		0	3

FIG. 6

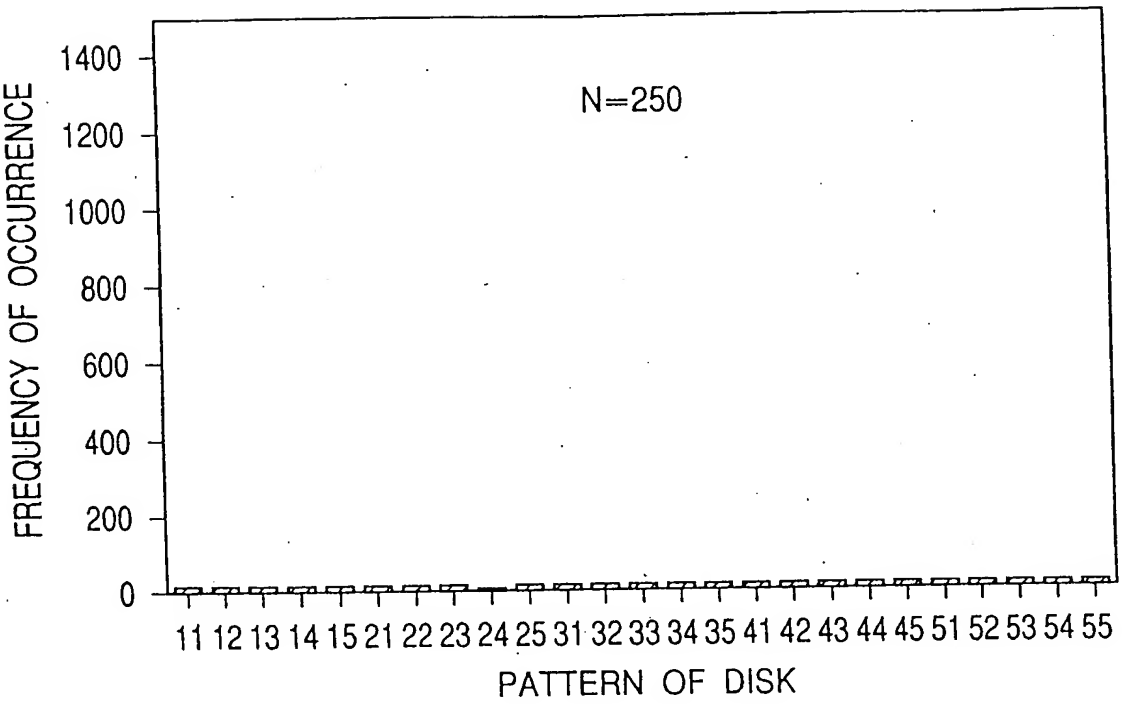

N=250
FREQUENCY OF OCCURRENCE
1400
1200
1000
800
600
400
200
0
11 12 13 14 15 21 22 23 24 25 31 32 33 34 35 41 42 43 44 45 51 52 53 54 55
PATTERN OF DISK

FIG. 7

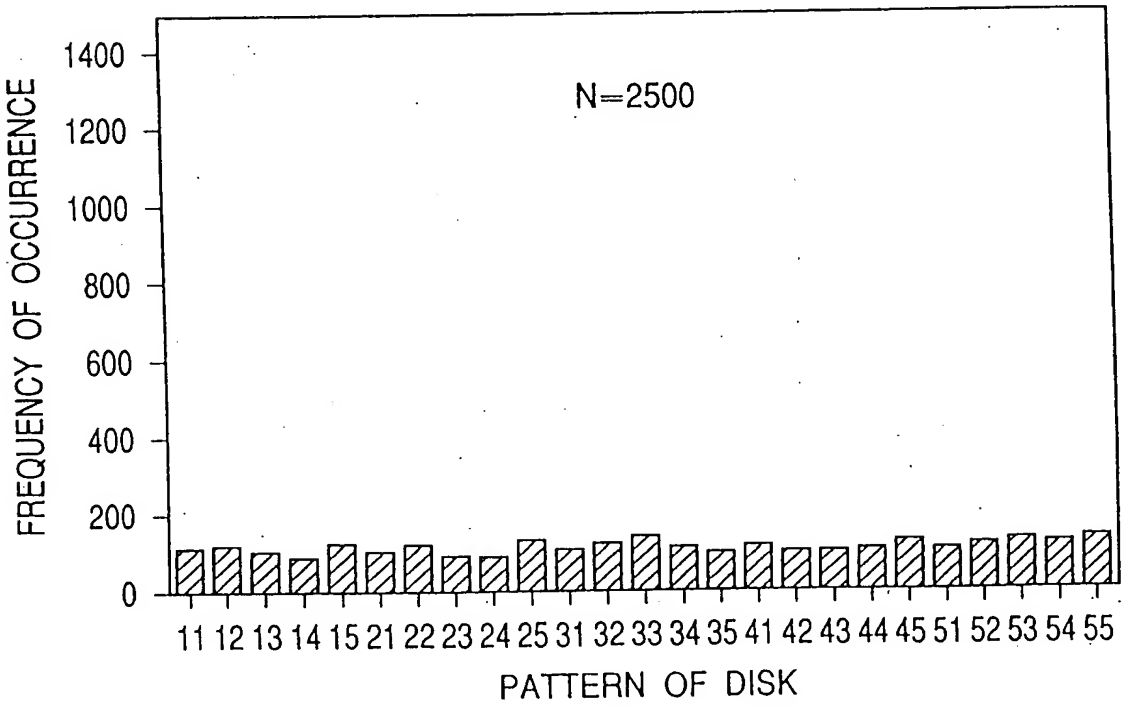

N=2500
FREQUENCY OF OCCURRENCE
1400
1200
1000
800
600
400
200
0
11 12 13 14 15 21 22 23 24 25 31 32 33 34 35 41 42 43 44 45 51 52 53 54 55
PATTERN OF DISK

FIG. 8

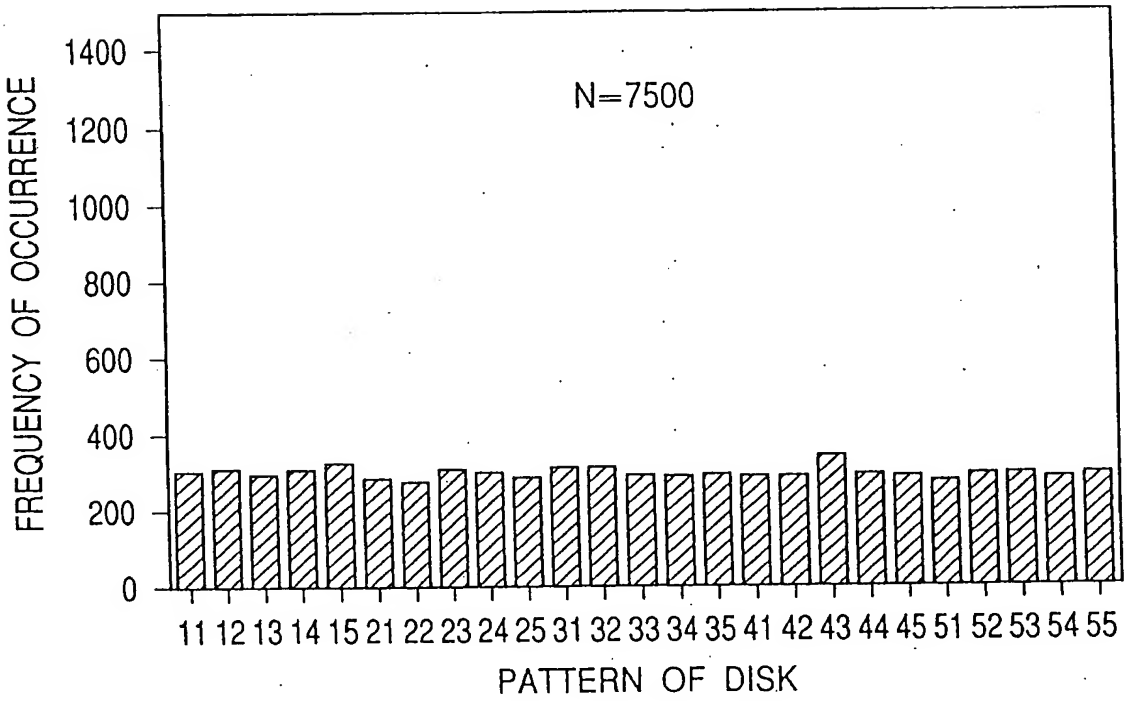

N=7500
FREQUENCY OF OCCURRENCE
1400
1200
1000
800
600
400
200
0
11 12 13 14 15 21 22 23 24 25 31 32 33 34 35 41 42 43 44 45 51 52 53 54 55
PATTERN OF DISK

FIG. 9

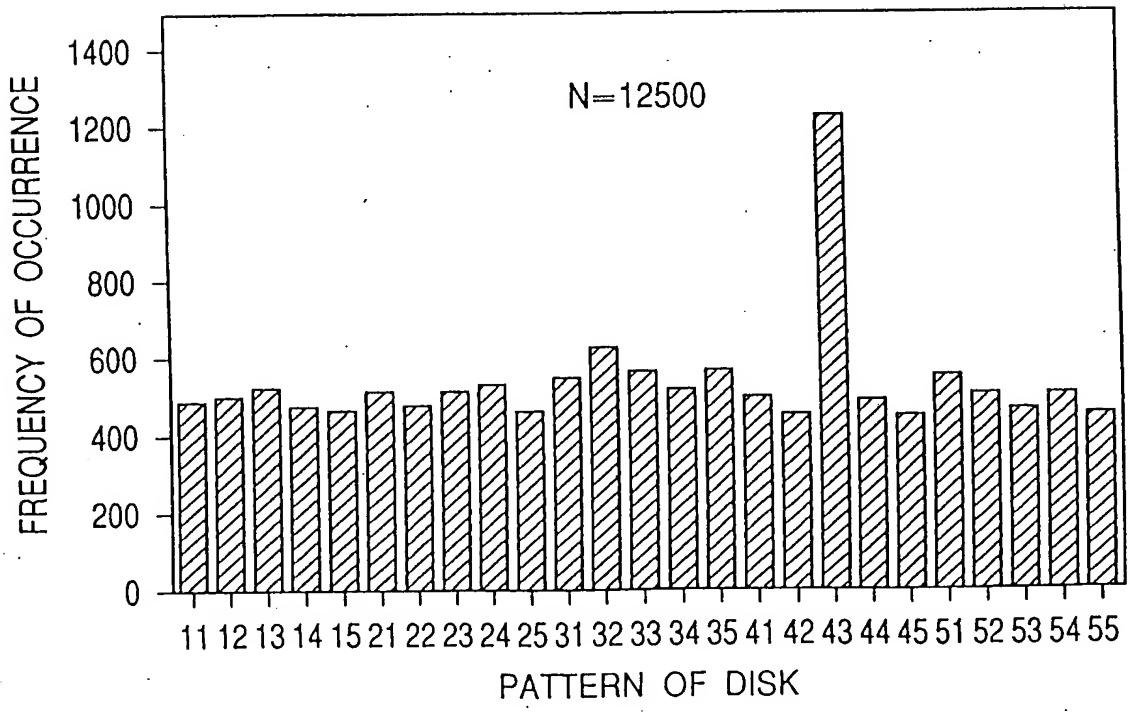

N=12500
FREQUENCY OF OCCURRENCE
1400
1200
1000
800
600
400
200
0
11 12 13 14 15 21 22 23 24 25 31 32 33 34 35 41 42 43 44 45 51 52 53 54 55
PATTERN OF DISK

FIG. 10

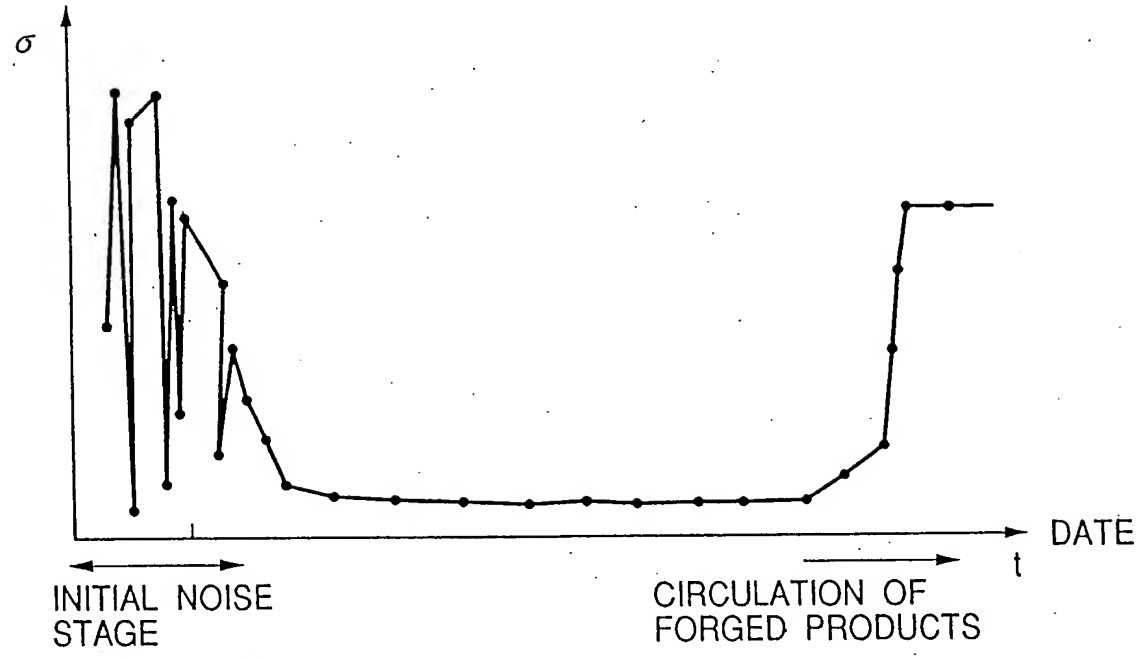

σ
DATE
t
INITIAL NOISE STAGE
CIRCULATION OF FORGED PRODUCTS

FIG. 11

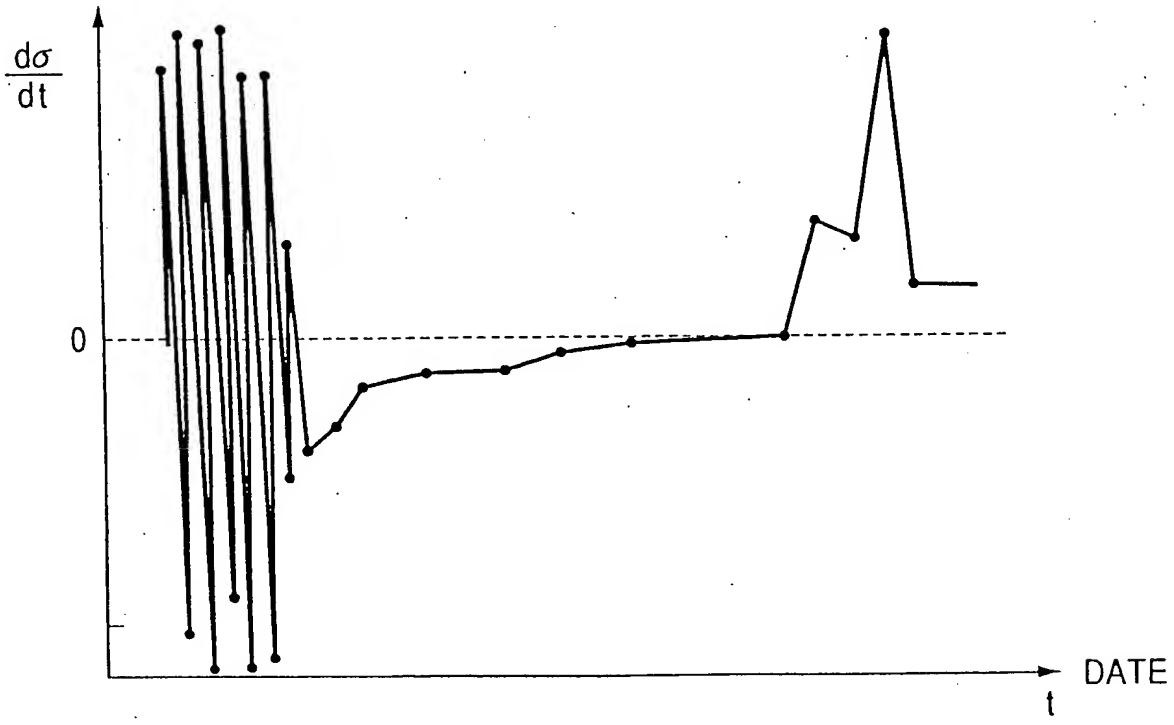

dσ/dt
0
DATE
t

FIG. 12

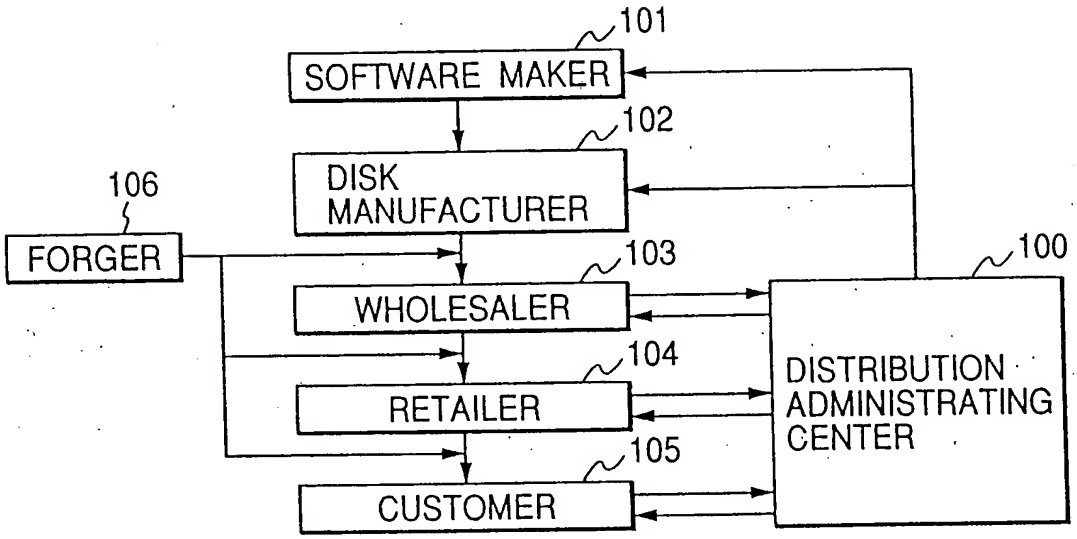

101
SOFTWARE MAKER
102
DISK MANUFACTURER
106
FORGER
103
WHOLESALER
100
104
RETAILER
DISTRIBUTION ADMINISTRATING CENTER
105
CUSTOMER

FIG. 13

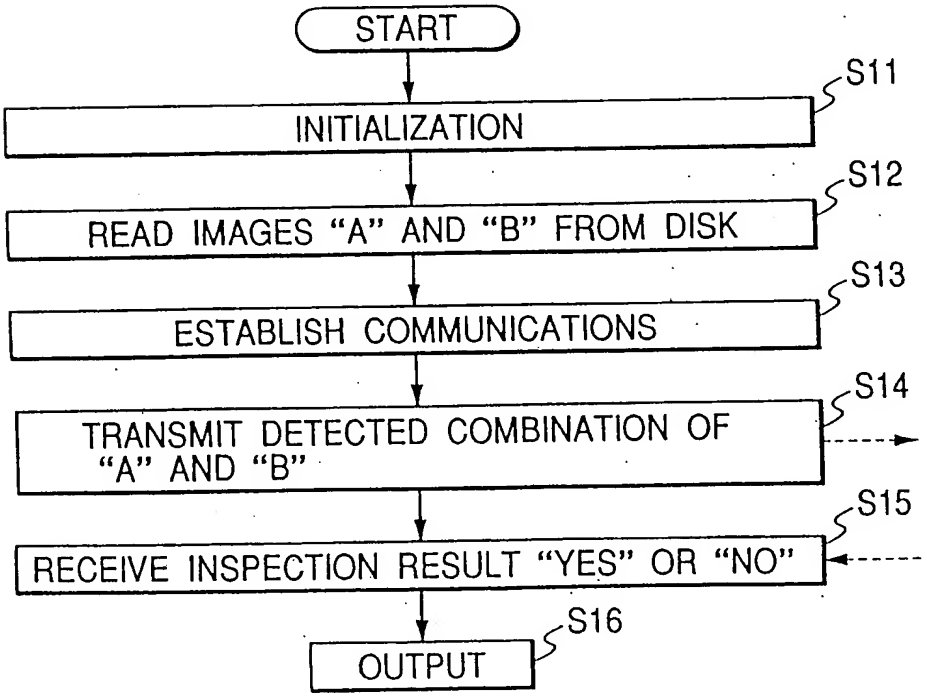

START
S11
INITIALIZATION
S12
READ IMAGES "A" AND "B" FROM DISK
S13
ESTABLISH COMMUNICATIONS
S14
TRANSMIT DETECTED COMBINATION OF "A" AND "B"
S15
RECEIVE INSPECTION RESULT "YES" OR "NO"
S16
OUTPUT

FIG. 14

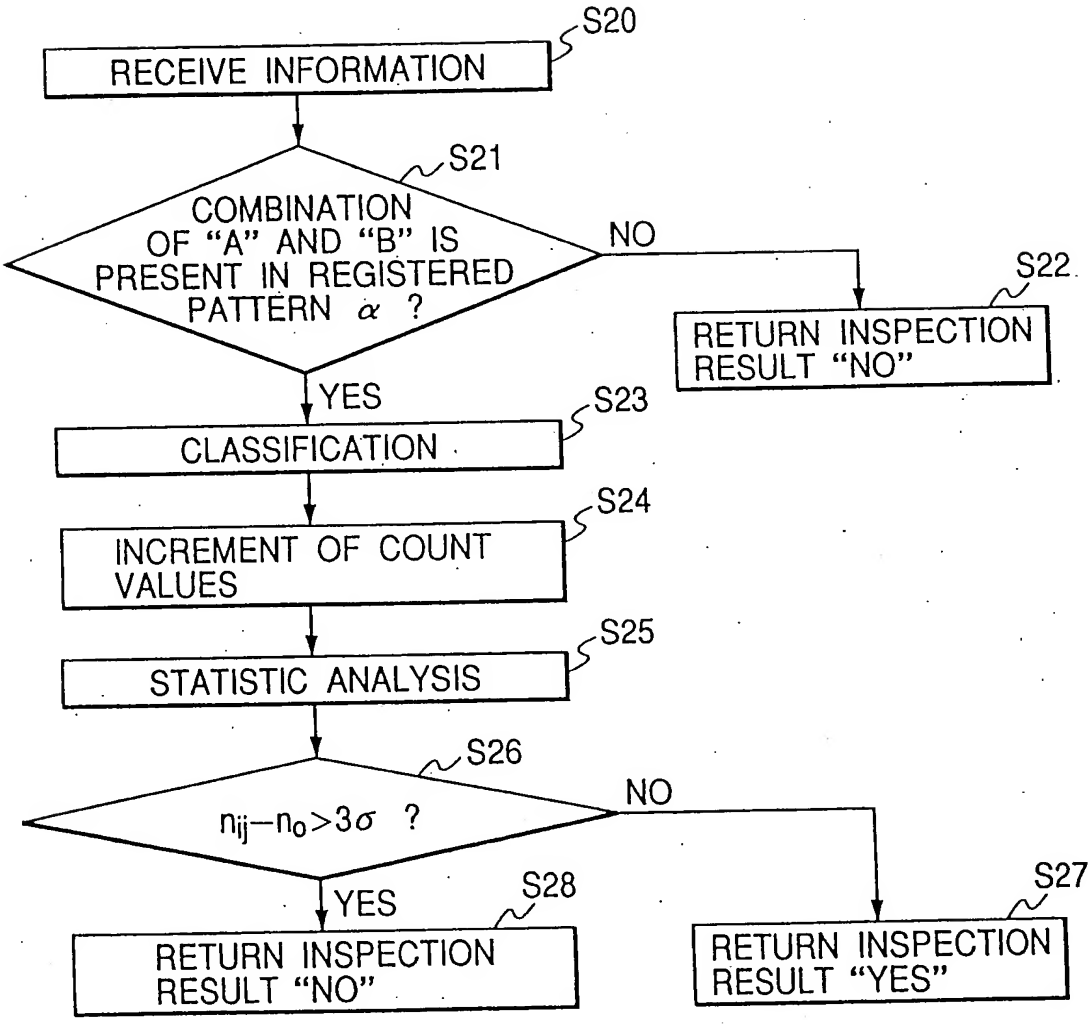

S20
RECEIVE INFORMATION
S21
COMBINATION OF "A" AND "B" IS PRESENT IN REGISTERED PATTERN α ?
NO
S22
RETURN INSPECTION RESULT "NO"
YES
S23
CLASSIFICATION
S24
INCREMENT OF COUNT VALUES
S25
STATISTIC ANALYSIS
S26
$n_{ij}-n_o>3\sigma$?
NO
S27
RETURN INSPECTION RESULT "YES"
YES
S28
RETURN INSPECTION RESULT "NO"

FIG. 15

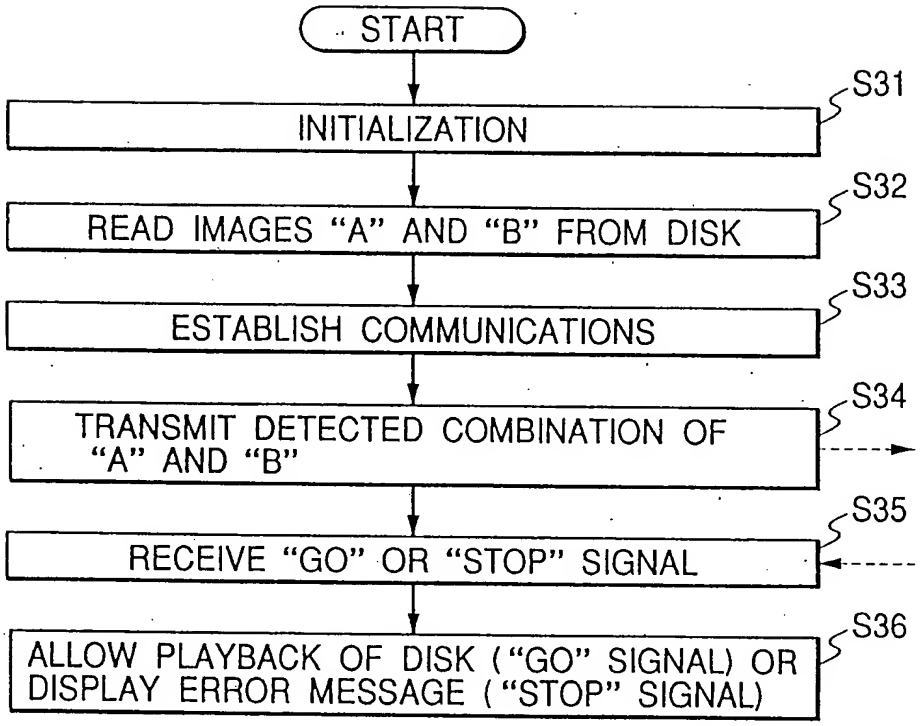

START
INITIALIZATION
S31
READ IMAGES "A" AND "B" FROM DISK
S32
ESTABLISH COMMUNICATIONS
S33
TRANSMIT DETECTED COMBINATION OF "A" AND "B"
S34
RECEIVE "GO" OR "STOP" SIGNAL
S35
ALLOW PLAYBACK OF DISK ("GO" SIGNAL) OR DISPLAY ERROR MESSAGE ("STOP" SIGNAL)
S36

FIG. 17

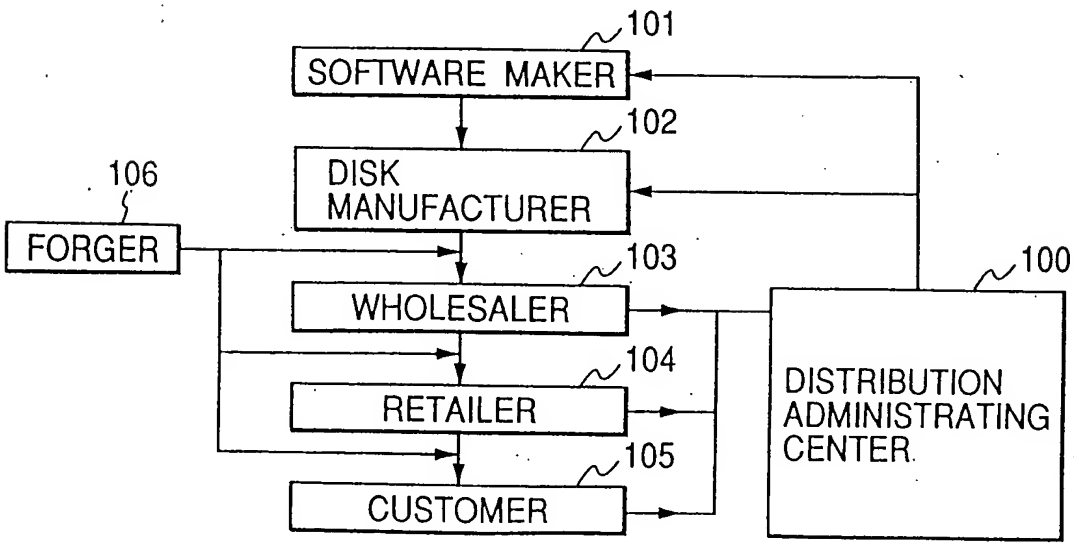

101
SOFTWARE MAKER
102
DISK MANUFACTURER
106
FORGER
103
WHOLESALER
104
RETAILER
105
CUSTOMER
100
DISTRIBUTION ADMINISTRATING CENTER

FIG. 16

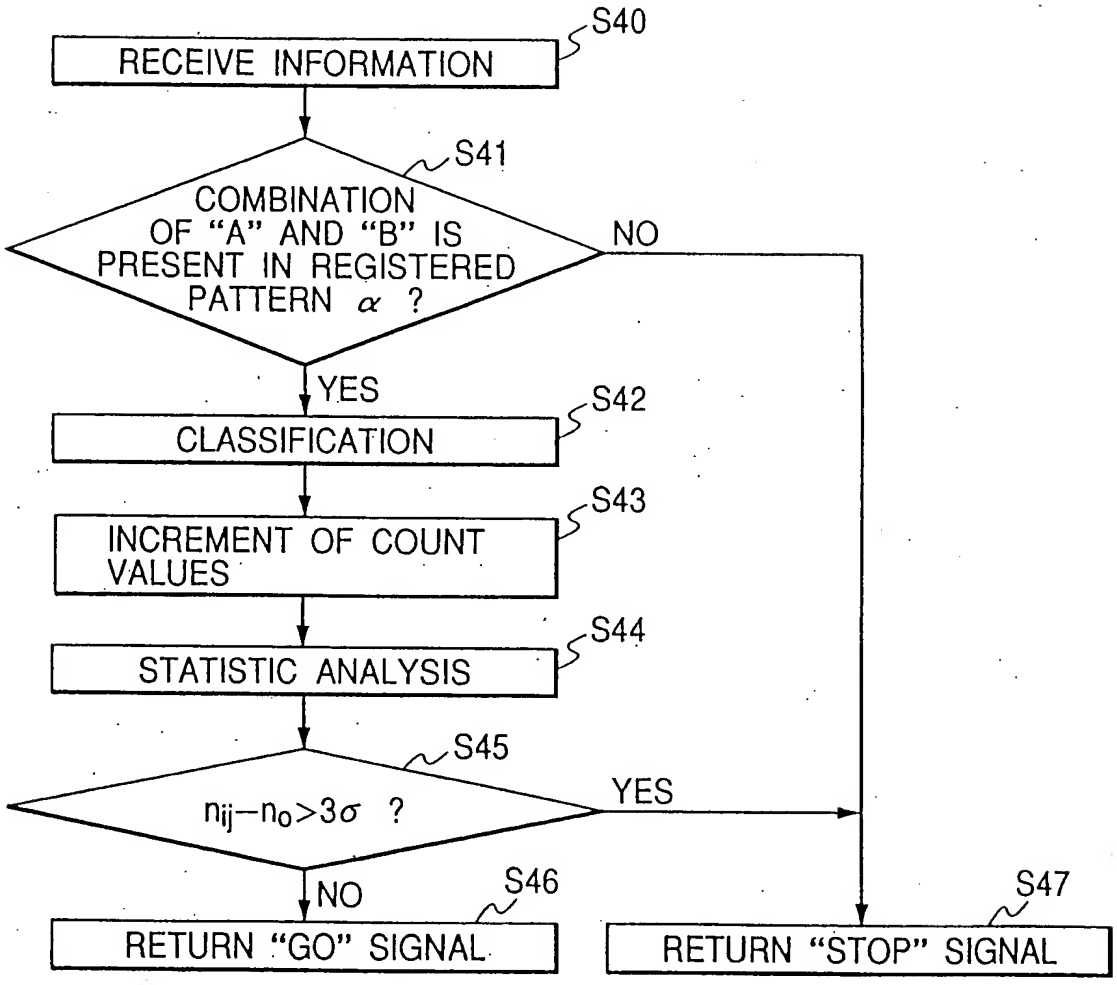

S40
RECEIVE INFORMATION
S41
COMBINATION OF "A" AND "B" IS PRESENT IN REGISTERED PATTERN α ?
NO
YES
S42
CLASSIFICATION
S43
INCREMENT OF COUNT VALUES
S44
STATISTIC ANALYSIS
S45
$n_{ij}-n_o>3\sigma$?
YES
NO
S46
RETURN "GO" SIGNAL
S47
RETURN "STOP" SIGNAL

FIG. 18

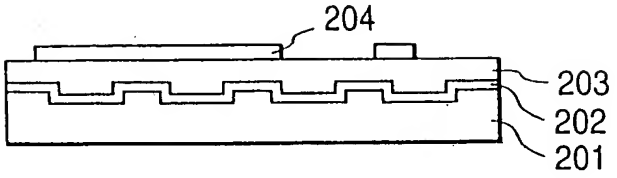


FIG. 19

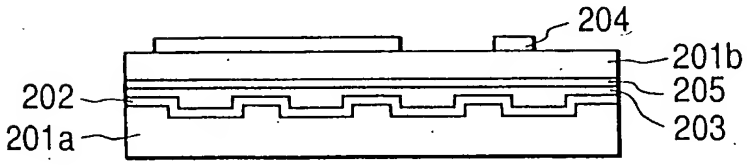


FIG. 20

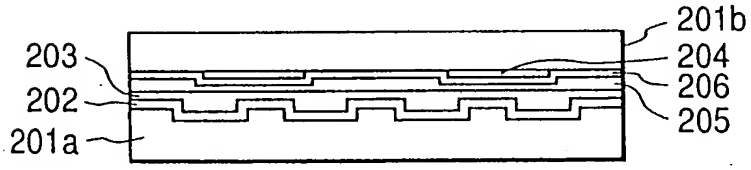


FIG. 21

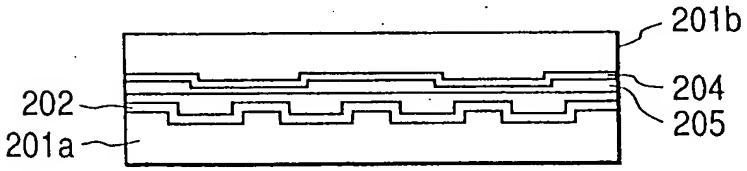


FIG. 22

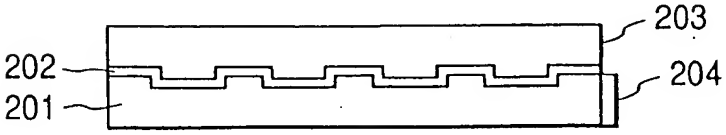


FIG. 23

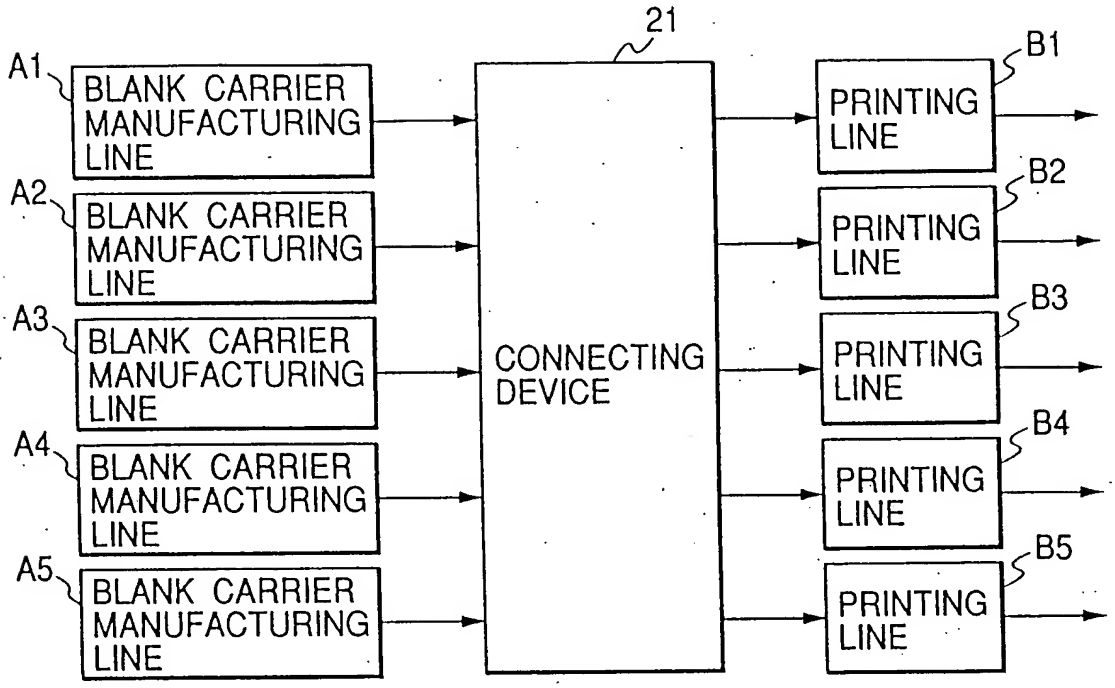
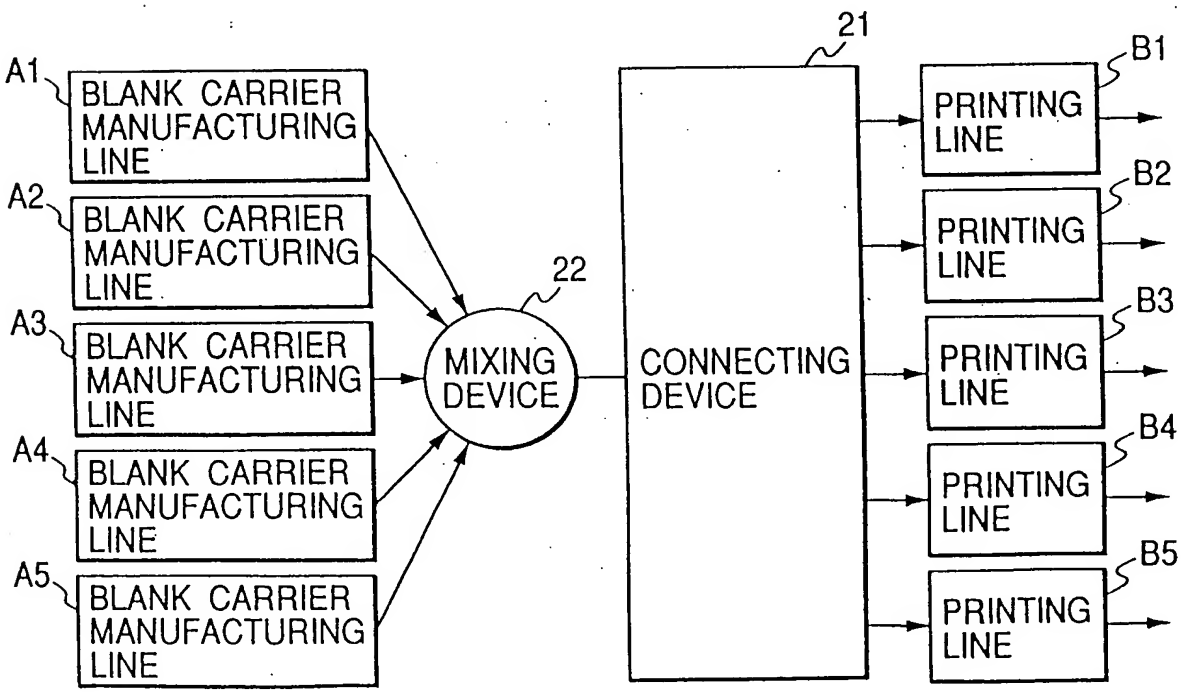

21
A1
BLANK CARRIER MANUFACTURING LINE
A2
BLANK CARRIER MANUFACTURING LINE
A3
BLANK CARRIER MANUFACTURING LINE
A4
BLANK CARRIER MANUFACTURING LINE
A5
BLANK CARRIER MANUFACTURING LINE
CONNECTING DEVICE
B1
PRINTING LINE
B2
PRINTING LINE
B3
PRINTING LINE
B4
PRINTING LINE
B5
PRINTING LINE

FIG. 24


21
A1
BLANK CARRIER MANUFACTURING LINE
A2
BLANK CARRIER MANUFACTURING LINE
A3
BLANK CARRIER MANUFACTURING LINE
A4
BLANK CARRIER MANUFACTURING LINE
A5
BLANK CARRIER MANUFACTURING LINE
22
MIXING DEVICE
CONNECTING DEVICE
B1
PRINTING LINE
B2
PRINTING LINE
B3
PRINTING LINE
B4
PRINTING LINE
B5
PRINTING LINE